

ADVANCED POWER CONVERTER

Module-I (10 hours) :Switched Mode Rectifier - Operation of Single/Three Phase Bridges in Rectifier Mode . Control Principles .Control of the DC Side Voltage.Voltage Control Loop. The inner Current Control Loop. Special Inverter Topologies - Current Source Inverter .Ideal Single Phase CSI operation, analysis and waveforms - Analysis of Single Phase Capacitor Commutated CSI. Series Inverters . Analysis of Series Inverters . Modified Series Inverter .Three Phase Series Inverter.

Module-II (12 hours) :Multi-Level Inverters of Diode Clamped Type, Flying Capacitor Type and Cascaded type; Basic Topology and Waveforms, Improvement in harmonics, High Voltage Applications: load compensation, series compensation, suitable modulation strategies - Space Vector Modulation - Minimum ripple current PWM method. Current Regulated Inverter -Current Regulated PWM Voltage Source Inverters . Methods of Current Control . Hysteresis Control . Variable Band Hysteresis Control . Fixed Switching Frequency Current Control Methods . Switching Frequency Vs accuracy of Current Regulation . Areas of application of Current Regulated VSI .

Module-III (11 hours) Buck, Boost, Buck-Boost SMPS Topologies . Basic Operation- Waveforms - modes of operation – Output voltage ripple Push-Pull and Forward Converter Topologies - Basic Operation .Waveforms - Voltage Mode Control. Half and Full Bridge Converters . Basic Operation and Waveforms- FlybackConverter .discontinuous mode operation . waveforms . Control - Continuous Mode Operation . Waveforms Introduction to Resonant Converters .

Module-IV (13 hours):

Classification of Resonant Converters . Basic Resonant Circuit Concepts . Load Resonant Converter . Resonant Switch Converter . Zero Voltage Switching Clamped Voltage Topologies . Resonant DC Link Inverters with Zero Voltage Switching .High Frequency Link Integral Half Cycle Converter.Introduction to active power factor control.

Texts/References:

1. Ned Mohan et.al : Power Electronics,John Wiley and Sons
2. Rashid :Power Electronics, Prentice Hall India
3. G.K.Dubeyet.al :Thyristorised Power Controllers, Wiley Eastern L